Method of conveying geographically conditioned information to vehicle or individuals.

The present invention relates to a method of conveying geographically governed information.

Systems are known with which information concerning traffic situations in towns, cities etc. for example can be transmitted by conventional radio transmission. One problem in this regard is that the information transmitted covers an entire area, normally an entire city or town, that is within range of the radio transmitter. This means that the information is relevant solely to those motorists that are located in the vicinity of a traffic accident for instance. The information is redundant with respect to other motorists.

There is, of course, a need to provide information, for instance information related to a traffic situation, on a more local basis, with the aid of a system that delivers different types of information to different geographical areas, for instance to different parts of a city or town or to different parts of a larger geographical area, or to deliver some other type of information. There is also a need to display information of a different type to that related to a traffic situation, for instance information concerning service stations and restaurants disposed along a road network. Such information is then displayed on signs displayed along the roads or highways concerned.

There is also a need to transmit information at a given time point prior to the subject of said information being discovered, noticed or taking place.

The present invention satisfies these requirement with regard to traffic situations and also with regard to other information directed to motorists. The subject matter described below can also be applied to individuals, i.e. to the presentation of information to separate individuals.

Accordingly, the present invention relates to a method of transmitting geographically governed information to automotive vehicles or to individuals, depending on the location of said vehicle or individual, wherein the invention is characterised by determining the exact or approximate position of the vehicle or the individual in relation to fixedly disposed units for radio communication between said units and a communications unit in said vehicle or carried by said individual; by causing a computer and associated database to contain information which includes different data relevant to different geographical areas; by causing said computer to send said relevant information to a receiving unit in each and every one of the vehicles whose positions have been determined and in accordance with the geographical area in which the vehicle or the individual are located.

The invention will now be described in more detail, partly with reference to an exemplifying embodiment of the invention shown in the accompanying drawings, in which

Fig. 1 is a diagrammatic illustration of a communications link;

Fig. 2 is a block diagram illustrating the application of the invention in accordance with a first embodiment;

Fig. 3 is a block diagram illustrating the application of the invention in accordance with a second embodiment;

Fig. 4 is a block diagram illustrating the application of the invention in accordance with a third embodiment; and

Fig. 5 is a diagrammatic illustration of various roads in a road network.

The present invention relates to a method of sending geographically governed information to automotive vehicles depending on the location of said vehicle.

According to the invention, the exact or approximate position of the vehicle is determined relative to spaced fixed units, for radio communication between said units and a vehicle-carried communications unit.

Known to the art are several different kinds of automatic identification systems that use radio frequencies, so-called RFID (Radio Frequency Identification) and which include identification tags (ID-tags) and communicators. Applicants provide such identification systems. In one such system, the communicators 10-12 constitute the fixed disposed units for radio communication between said units and a vehicle-carried communications unit in the form of an ID-tag or transponder 6,8,9, see fig.2.

Also shown in fig. 1 is a vehicle identification communications unit. The communications unit includes a transponder 1 and a communicator in the form of a transceiver unit 2. The communicator 2 is adapted to send an inquiry signal 3 to the transponder 1. The transponder is adapted to receive the inquiry signal and therewith reflect and modulate said signal. The communicator 2 is adapted to receive the reflected signal 4 and to decode its information content.

The ID-tag 6,8,9 is conveniently applied to the inner surface of the windscreen of the vehicle to be identified. The vehicle identity can be read by a communicator 10-12 at a given smaller distance from the vehicle, such as a distance from 5-10 metres for instance. Depending on the design of the system, it is also possible to read and write-in other information contained in the ID-tag with the aid of the communicator 10-12, in addition to reading the identity of the vehicle.

The relatively short range makes possible communication with the ID-tags within a geographically limited communications area.

According to a first embodiment of the invention, one such transponder system is used when practising the invention.

The transceiver unit is 10, 11, 12 is suitably placed at a portal that extends over all traffic lanes. The transceiver thus reads the transponders that pass through the portal.

The transceiver unit 10, 11, 12 is connected to a main data system that includes a database 7 and a computer 16. The connection to the main data system 5, 16 may be a cable connection, a radio connection, a W-Lan connection, a GSM/GPRS/G3 connection or the like.

Because the vehicle passes a communicator 10-12 which reads the vehicle-carried transponders 6, 8, 9 and results in read data being transferred to the computer, the vehicle will be identified in the data system.

According to the invention, a computer 16 and its associated database 7 in the main data system is caused to contain information that includes various items of data that are relevant to different geographical areas.

This information may concern traffic situations at different places, advertisements, information of the distance to the next gas station, restaurants, etc. or other information relevant to a vehicle-passenger with respect to the geographical position of said vehicle.

According to the present invention, the computer 16 is caused to send said relevant information to a receiving unit 14, 15 in each of the vehicles whose position has been determined and depending on the geographical area in which the vehicle is located.

According to one preferred embodiment, the receiving unit is comprised of a mobile telephone 15 or a vehicle-carried computer 14 said telephone 15 or computer 14 being adapted to receive an information carrying signal via a mobile telephone network, for instance in the form of an SMS-message, an MMS-message, an E-mail message or a voice message.

According to a first embodiment of the invention, each vehicle is equipped with said communications unit in the form of a transponder 6, 8, 9 which can be read by means of respective permanently placed or fixed units in the form of a communicator which includes a transceiver unit 10, 11, 12 which communicator is caused to send an inquiry signal to the transponder, wherein the transponder (6,8,9) is designed to answer the inquiry signal and therewith caused to transfer the transponder-related identification information to the

communicator, which is caused to receive this information. Communicators are placed along the stretches of road located in the various geographical areas in which it is desired to present said information, wherein each communicator that reads a transponder is caused to send said identity information to said computer, and wherein said geographically governed information is then sent to said vehicle-carried receiving unit.

By each vehicle is meant each vehicle that is connected to the system included by the invention. For instance, it is conceivable that the owner of a vehicle subscribes to the system against the payment of a certain fee and therewith receives a transponder. In this regard, an ID-number can be stored in the transponder and tied to the owner of the vehicle in said database 7, together with the mobile telephone number to the vehicle-carried receiving unit.

According to one preferred embodiment of the invention, the transponder is a so-called RFID-transponder.

According to a highly preferred embodiment of the invention the approximate position of the vehicle and the direction in which it is being driven are determined when the vehicle-carried transponder 6, 8, 9 has been read by two or more mutually sequentially located communicators 10-12.

Two or more mutually sequential readings enable the data system to determine the travel direction of the vehicle and its average speed. This knowledge can be used as a basis for deciding which information shall be sent to the vehicle-mounted receiving unit 14, 15. This is illustrated in fig. 5, in which the reference numerals 40-44 identify different

stretches of a road, wherewith the reference numerals 45-48 denote said permanently placed units for radio communication, and wherewith the reference numerals 49, 50 denote restaurants and the reference numeral 51 denotes a gas filling station.

For instance, when the vehicle has been read at 46 and then at 45, the inventive system is able to send a message to the effect that a restaurant 49 lies within the range of 5 km, for instance. The same applies to a vehicle that has been read at 46 and then again at 47. When a vehicle has been read at 46 and then at 47, the system according to the present invention is able to send a message to the effect that a filling station, gas station, lies within the range of 3 km, for instance.

However, two messages can be sent to a vehicle that passes at 45, namely a message to the effect that a restaurant 49 is situated along road 40 to the left in fig. 5 of the present location of the vehicle, and a message to the effect that a restaurant 50 is situated along road 43. This information can be evaluated by the driver or passengers of the vehicle.

According to a second embodiment of the invention, each vehicle is equipped with said communications unit in the form of a mobile telephone 26, 28, 29 and the approximate position of said telephone is established through the medium of said permanently placed units in the form of base stations 20-22 belonging to a mobile telephone system, wherein information relating to the position of the mobile telephone 26, 28, 29 identified by respective base stations 20-22 is transferred to said computer 16, and wherein said geographically governed information is then sent to the vehicle-carried receiving

unit, said receiving unit being the said mobile telephone 26, 28, 29. Thus, in the case of this embodiment the mobile telephones and base stations are used to determine the exact or approximate position of the vehicle, instead of transponders and communicators.

Correspondingly to the method illustrated in fig. 5, it is preferred in the case of this second embodiment that the approximate position of the mobile telephone 20-22 and the direction in which the vehicle travels are determined when the mobile telephone is in the area covered by a base station after having been located within the area covered by an adjacent base station. The reference numeral 45-48 in fig. 5 denote base stations that are relevant in this latter case.

According to a third embodiment shown in fig.4, each vehicle is equipped with a communications unit in the form of a vehicle number plate or registration plate 36, 38, 39, whose registration number can be read optically by means of said permanently placed units in the form of video cameras 31-32. These video cameras are spaced along stretches of road in different geographical areas within which it is desired to send information. Each video camera that reads a registration number is caused to transfer this number to the computer 16, wherewith the geographically governed information is then sent to said vehicle-carrying receiving unit 14, 15.

According to a preferred embodiment, some of said geographically governed information is sent to respective receiving units 14, 15 only at given time intervals.

According to a further embodiment of the invention some of said geographically governed information is sent to

respective receiving units 14, 15 only once or only a predetermined number of times.

Thus, the present invention allows information to be sent to vehicles in accordance with their geographical positions at that time.

It has been said in the aforegoing that such information may relate to traffic situations at different places, advertisements, information relating to distances to gas stations, restaurants, etc. or other vehicle/passenger relevant information referable to the geographical position of the vehicle.

For instance traffic situation information may relate to accidents, road works, traffic queues, alternative routes, and so on. Gas station information may also concern vehicle service stations, eating places, etc.. Advertisements may relate to taverns, restaurants, hypermarkets, pleasure parks, things worth seeing, and so on.

Further embodiments are concerned with an individual as opposed to a vehicle; see figures 2 and 3. According to one embodiment concerning individuals, essentially all individuals have about their person a mobile telephone 26, 28, 29 that is able to function as a transponder in the aforesaid respect. For example, an individual who moves in the proximity of a base station 20-22 located close to a large store or the like may receive on his her/her mobile telephone 26, 28, 29 advertising material sent from the store. This may mean that the individual receives information about a product which he/she then purchases at precisely this store. Another example is one where an individual approaches the platform of a subway station and passes a base station

20-22 and therewith receives information via his/her mobile telephone 26, 28, 29 as to the departure of the next train to a given destination, or information relating to a stoppage in subway traffic.

According to another embodiment, an individual may be equipped with a transponder 6, 8, 9 which is not seated in some other technical device, such as a mobile telephone, and which communicates with communicators as described above. The transponder may, however, be included in some other technical device, such as a mobile telephone.

Although the invention has been described above with reference to a number of embodiments thereof, it will be obvious that the structural design of the various embodiments can be modified without a change in function.

It will therefore be understood that the present invention is not restricted to the aforedescribed exemplifying embodiment thereof since variations can be made within the scope of the accompanying claims.